DISSERTATION ON

A STUDY ON SCHOLASTIC BACKWARDNESS IN CHILDREN

Dissertation submitted to
THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
in partial fulfillment of the requirement
for the award of degree of

MD BRANCH – VII
PAEDIATRIC MEDICINE

INSTITUTE OF CHILD HEALTH
AND HOSPITAL FOR CHILDREN
MADRAS MEDICAL COLLEGE
CHENNAI

MARCH 2009

CERTIFICATE

*Certified that this dissertation entitled **"A Study on Scholastic Backwardness in Children"** is a bonafide work done by **Dr. Hemchand Krishna Prasad,** Post graduate, Institute of Child Health and Hospital for Children, Madras Medical College, Chennai, during the academic year 2006-2009.*

Prof. Dr. SARADHA SURESH, **M.D., Ph.D., F.R.C.P. (Glas),** Director and Superintendant Institute of Child Health & Hospital for Children HOD and Professor of Pediatrics Madras Medical College Chennai – 600 003	**Prof. Dr. JAYANTHINI V** **M.D.,DPM.,** Professor of Psychiatry Institute of Child Health & Hospital for Children Madras Medical College Chennai 600 003	

Prof. Dr. T. P. KALANITI, M.D.,
Dean
Madras Medical College, Chennai

ACKNOWLEDGEMENT

I express my sincere thanks to **Prof. Dr. T. P. KALANITI, M.D.,** Dean, Madras Medical College for allowing me to do this dissertation and utilize the institutional facilities.

I express my sincere and heartfelt gratitude to Prof.Dr.SARADHA SURESH, M.D., Ph.D., F.R.C.P. (Glas), Director and Superintendent, Institute of Child Health and Hospital for Children, Chennai, to whom I am greatly indebted for her constant encouragement, valuable guidance and relentless support throughout my postgraduate course. Words are few to express my gratitude to her for sparing her precious time and energy in trying to bring out the best in me.

I am extremely thankful to Prof. Dr.V Jayanthini, MD Psy DPM., Professor of Psychiatry, Child Guidance Clinic, Institute of Child Health and Hospital for Children, Chennai for her invaluable help and guidance.

I thank Dr P.P.Kannan, MD (Psy), Assistant Professor, Child Guidance Clinic, for his valuable suggestions while doing this study.

I would to like to thank the Assistant Professors in Paediatrics, **Dr. ELILARASI**, **Dr. K. SUGUNA**, **Dr. C. RAVICHANDRAN** and **Dr. P. SUDHAKAR** for their help and support.

I would like to thank the School Health Cell Medical Officer **Dr. SABAPATHY RAJ,** for his valuable help and support.

I would like to specially thank all my colleagues for their constant encouragement and support.

I am indebted to all the children who participated in this study and their parents without whom this study would not have been possible.

CONTENTS

Introduction

1. INTRODUCTION

Education is one of the most important aspects of human resource development. Every child should have the opportunity to achieve his or her own academic potential. Indian parents give high priority to their children's education. Therefore, a child who does not do well in studies is cause for major tension in the family unit. A child whose scholastic problems have not been adequately addressed and sorted out, is bound to carry a lifelong burden, as a result of which he/she would have difficulties with completion of school, interpersonal relationships, higher education, prospects for employment, marriage etc.

Poor scholastic performance

Poor marks must be seen as a symptom of a larger underlying problem in children. This symptom results in child having low self-esteem. If the child is not performing, there has to be an underlying cause that needs to be assessed.

Activity based learning

The present schools in Tamil Nadu are slowly replacing the previous system of marks with ABL (Activity Based method). Competencies are split into various parts and converted into different activities. Child's progress is assessed through annual assessment charts, not by marks. Details of Activity Based Learning are given in Annexure II.

Contributory Factors

In a multi-linguistic Indian educational setting, children often have to learn to study through the medium of language not their own. They also need to learn 2 - 3 languages simultaneously. The following are the common causes for poor scholastic performance of the child

In the home environment

- Deprived, discordant, un-stimulating home environment
- Lack of adequate facilities for studying, Noisy homes [5]
- Lack of encouragement for studying and lack of role models
- Parental illiteracy
- TV viewing habits [6]
- Significant life events

- Child abuse
- Single parent, separated parents
- Alcoholic, workaholic parents
- Exposure to toxins such as lead, endosulfan [7] and other organophosphate compounds [8]
- In the adolescents- daily study pattern, family environment conducive to learning, education status of parents, personal distractions and attitude towards studies contribute to academic performance [9,10]

In the school environment

- Recent change of school/ medium of teaching
- Over-expectation parents and teachers
- Poor / inadequate teaching methods
- Overcrowded classrooms
- Role based learning methods and poor study skills
- Teacher insensitivity to problems of children with poor scholastic performance

In the child

Etiology is diverse and many factors may be overlapping and coexistent:

Mental retardation (MR): Children with mental retardation have a significantly sub average general intellectual functioning, with IQ below 70.

Slow learners: Children with an IQ range of 70 – 89 are classified as slow

learners.
Language disorders: McKeith and Rutter estimated on the basis of literature review that 1% of all children enter school with a marked language handicap. [13]
Hearing impairment: Even mild to moderate hearing loss in childhood is associated with poor language development in early childhood and with lower educational achievement[15] and employment opportunities later in life.
Visual impairment: Visual impairment, often unidentified, may cause learning difficulties[16]. Children with visual impairment may present with certain features such as deterioration in handwriting and slowness in copying from the board.
Hypothyroidism: Hypothyroidism is a cause for scholastic backwardness if the condition is not diagnosed and treated early.
Prematurity, low birth weight: Research has consistently demonstrated a greater risk for learning-related problems in preterm, low birth weight children. [18.19]

Developmental coordination disorder (DCD): Children with

developmental coordination disorder have difficulty learning and

performing age-appropriate perceptual-motor skills in the absence

of diagnosable neurological disorders[11].

Attention Deficit Hyperactivity Disorder (ADHD): Untreated

ADHD is one of the important causes for poor School

performance. [12]
Chronic and recurrent illness: Several medical problems in the child contribute to learning problems. This may be due to the direct effect of the condition itself, or due to effects leading to recurrent school absenteeism, adverse effects of medication and poor self esteem affecting motivation and performance.
Our Institute has a Child Guidance Clinic, which is run by experts trained in child psychiatry, to deal with common problems in child psychiatry. The common problems managed at the clinic include breath holding spells, mental sub normality, ADHD, temper tantrums. Poor school performance is one of common reasons for referral to the Child Guidance Clinic.

SPECIFIC LEARNING DISABILITY

2. SPECIFIC LEARNING DISABILITY

Specific learning disability will be dealt with in some detail as this is an entity that requires special mention and it is a potentially correctable problem**.**

Definition of Specific Learning Disability (SLD) by the National Joint Committee on LD[21]

It is a heterogeneous group of disorders manifest by significant difficulties in the acquisition and the use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span.

Classification

The ICD-10[22] Classification of Disorders of Psychological Development and American DSM IV[23] Classification is given in Annexure III.

Warning Signs of Learning Disability

A child with SLD would be giving cause of concern- particularly as regards reading, writing and spelling, all very important skills in the school curriculum. With experience, however, and from the findings of research studies, it is now evident that there are many signs well before school age, which may suggest such a profile and the consequent difficulties ahead. These may be called as early warning signs of SLD. Therefore, it is important not to ignore a delay in speech. A child who has not spoken even a single word by 1yr 5 months, around 3 words by 1 ½ yr, 2 word sentences by 2 yr or 3 word sentences by 3 yr must be given the benefit of a hearing assessment and an assessment of whether the child is 'at risk' for learning disability. Early warning signs related to language development may also include: late talking, inadvertently hitting or grabbing instead of communicating verbally, pronunciation problems, slow vocabulary growth, difficulty rhyming words, trouble learning numbers, the alphabet, the days of the week. Many students placed in special education as SLD show minimal gains in achievement and few may actually leave special education.[27]

Indicators of Learning Disability in school going child

SLD causes lack in academic skills in the following areas

- Reading skills
- Writing skills
- Arithmetic skills

These are discussed in Annexure III

Diagnosis of SLD

All children with scholastic backwardness must have audiometric and ophthalmic

examinations done to rule out hearing and visual deficits. The clinical or educational psychologist conducts the standard intelligence test *viz*., Wechsler Intelligence Scale for Children (WISC) test to determine that the child's intellectual functioning is average or above average. This helps to exclude borderline intellectual functioning and mild mental retardation which cause poor school performance that is more difficult to remediate than SLD. The Special Educator assesses the child's academic achievement by administering standard educational tests to assess the child's performance in areas such as reading, spelling, written language, and mathematics. An academic achievement of two years below the child's actual school grade placement or chronological age is considered diagnostic of SLD if the child's intelligence is average or above average[28,29].

Remediation of SLD

It is a specific method of instruction or teaching based on specific deficits in performance of a given child. Since every child has his/her unique deficits, an Individualized Education Plan (IEP) needs to be made for every child. The child's strengths are identified so that they may be developed and strategies to cope with the lacunae in learning ability are improvised.

Principles of Remedial Education [1]

The program is started at the level the child has already achieved. The program should proceed at a pace comfortable for the child. Each stage is given a lot of practice and drills as much as possible, these instructions should be given in the form of games, puzzles or in any format that motivates and enthuses the child. The intervention should happen as early in primary school as possible (6-8yr of age) so that when the child reaches middle school or secondary school, more advanced reading, comprehension and study skills can be developed

Each session should preferably be for a minimum one hour duration. Two to three sessions must be conducted every week. Sessions should continue all the year round and not only during vacations or schooldays. However, the sessions could be intensified during the vacation

Facilities or provisions available for children with SLD

Children evaluated fully and diagnosed as having learning Disability can avail of certain provisions or facilities extended by various boards of education such as the CBSE or ICSE.

- Extra time for board examinations is available
- Provision of scribes for children with dysgraphia
- Use of calculators in the examinations - dyscalculia
- Selection of optional subjects instead of a subject the student is

finding difficult to learn.

Although lot of literature is available on Specific Learning Disability, there exists no specific protocol with the School Teacher or the School Health Cell to facilitate them to screen the Scholastic Under-achievers and provide them appropriate guidance.

Literature Review

3. LITERATURE REVIEW

Scholastic Backwardness

It is generally observed that at least 20% of the children in a class room get poor marks – they are scholastically backward. Poor marks must be seen as a symptom reflecting a larger underlying problem in children. The prevalence of scholastic backwardness in previous studies by MKC Nair et al [1] was 5 – 15 % and one by Shenoy et al [2]estimated it to be 10.38 %. Both the studies defined scholastic backwardness as repeated failures in grades and poor academic achievement securing marks < 35 %. Viewing scholastic backwardness in terms of poor academic achievement, several Indian surveys in the past two decades have recorded prevalence rates that range from 20 – 50 % (Kapur, 1985; Rozario, 1988; Sarkar, 1990; Venugopal and Raju, 1988). Scholastic achievement may be influenced by factors in the child as well as factors in the home and school environment.

Demographic factors

It has been well recognized that children from poor socio economic status families have higher chances of poor school performance. [45]

Shenoy et al[2]in a cross sectional Study involving 1535 children studying in five schools in Bangalore proved that families which lacked basic amenities like Water Supply, Electricity and drainage had a high risk of Scholastically backward children.

Study of Sethy et al revealed high drop out rates of children in Bombay slums, and, attributed it to the deficiency of Iodine. A Study by Kanawada T et al also revealed that presence of high noise adversely affected the health of the child, which in turn affected the School performance. He also proved that noisy unstimulating homes and poor economic conditions lead on to poor school performance.

Family Issues

In the study by MKC Nair et al [1]Multi variate analysis showed the following predictor variables for poor school performance: low education status of the mother, lower study habit rating score scale, not studying daily lessons, poor concentration in studies, lower education of the father and unhappy family. Shenoy et al [2] in his study observed that alcohol consumption by the father, poor parental interaction, inconsistent disciplining by the parents were high risk factors for scholastic backwardness. Family environment not conducive to learning, lower education status of parents, personal distractions and poor attitude towards studies contribute to academic performance in children in India[9,10]

Malnutrition due to poverty coupled with low education and status of parents adversely affect their cognitive performance. [46] Such children also have higher chances of experiencing, right from pre-school years, parental attitudes that do not motivate them to study and an unsatisfactory home environment which does not encourage them to study and an unsatisfactory home environment which does not encourage learning (witnessing domestic violence, family stressors and adverse life events)

Sociocultural Issues

Shenoy et al[2] in his study made an observation that increased school changes, lower frequency of private tuition and decreased hobbies were risk factors for poor scholastic performance. Television viewing in childhood and adolescence is associated with poor educational achievement by 26 years of age. A study by Robert Hancox et al [36]on 1000 American children revealed that - excessive television viewing in childhood might have long-lasting adverse consequences for educational achievement and subsequent socioeconomic status and well being. Break fast plays an important role of in promoting acute cognitive improvements, but also improves outcomes such as school performance. [41,42]

Medical Issues

Hearing impairment Children with otitis media with effusion and associated conductive hearing loss have been reported to score low in mathematics and expressive language.[38] mild sensorineural hearing loss affects about 5% of the school aged population and these children experience difficulty on a series of educational measures. [39]

Vision Impairment Reduced vision because of uncorrected visual acuity is a major public health problem in India. The overall prevalence of hyperopia is 7.7% of the children and myopia is 7.4%[40] refractive error, amblyopia, strabismus, and astigmatism are common conditions among young children, affecting 5 percent to 10 percent of all preschoolers. In a study conducted in Gujarat, visual impairment was present in 6.1%. It was found that refractive error was the cause of the problem in 61% of children with vision impairment, amblyopia in 12%, other causes in 15%, and unexplained causes in the remaining 13%. [17]

Hypothyroidism Study by Sankar R et al[34] hypothesized that school attainments of early treated congenital hypothyroidism children are within normal range if treated early and adequately. **Asthma** Children with poorly controlled asthma have increased school absenteeism[43]. Children with moderate to severe asthma may perform poorly in school due to stress related to a chronic illness. [44]

Below Average Intelligence Study by Kaznowski K et al [33] hypothesized that Intelligence (measured as Intelligence Quotient) is one of the important prognostic variables in the academic outcome of children.

Slow Learners A study by Krishna Kumar et al from Calicut evaluated the effectiveness of Individualized Education Plan on Slow learners and proved that

they may be highly effective.[37] Slow learners are considered neither learning disabled nor mentally retarded, students with below average cognitive abilities who are not disabled, but who struggle to cope with the traditional academic demands of the regular classroom. 8-9 percent of primary school children score below average in standard IQ tests.

Specific Learning Disabilities

Herman (1959) published the oldest follow-up of reading disabled children. He reviewed 72 Danish backward readers – and found that the average reading ability was 6th level. 50% held skilled jobs. But the study did not have a control sample. In Carter's study (1964), 66% of 35 boys had persisting poor reading. Most had lower educational and occupational outcome. Despite this growing interest we still have no clear idea about the incidence and prevalence of LD in India. Not many Indian studies exist on the exact prevalence of dyslexia. The Study by Shenoy et al[2] estimated the prevalence of LD to be 15%, and the study by Venugopal and Raju estimated the prevalence to be 20.6 %. The incidence of dyslexia in school children in USA ranges between 5.3-11.8.[49] Although previously it was believed that dyslexia affects boys primarily, recent data indicate that boys and girls are affected equally[47,48] The earlier male preponderance has been attributed to a referral bias in school-identified children.[50] There is no one single unified theory that explains the etiology of dyslexia. Recent functional MRI brain studies indicate that the disorder may be caused by specific deficits in the left fronto-temporal region or atypical asymmetries in the left peri-sylvian region.[24] With the current neuro-imaging techniques, it is possible to view live brain cells in action. The scans below show differences between normal and dyslexic brains during reading. SLD has a genetic basis [25] and therefore, if one child has SLD, almost half his siblings are likely to have SLD. A significant warning sign is speech delay as good prospective studies have demonstrated that dyslexia most likely has precursors in language development.[26] Therefore, it is important not to ignore a delay in speech.[28] An academic achievement of two years below the child's actual school grade placement or chronological age is considered diagnostic of SLD if the child's intelligence is average or above average[28,29]Remediation is the corner stone of management of SLD.[30] Children with SLD who availed the benefit of provisions showed a significant improvement in their academic performance at the SSC board examination.[32] Literature review shows that though many studies on Learning Disability exists, there is no uniformity in them due to - difficulties ranging from the definition of LD, identification and assessment. Their applicability to our population is doubtful due to socio-cultural factors unique to India. There is no uniform methodology to evaluate scholastic backwardness.

Study Justification

4. STUDY JUSTIFICATION

Review of the literature definitely proves that not many Indian studies exist, on the prevalence of Specific Learning Disability as a cause of scholastic backwardness. Moreover definite markers of Learning Disabilities have not been established in the regional languages of India.
Also, evaluation of dyslexia involves assessment of Intelligence Quotient – which is a very expensive and laborious affair. GLAD (Grade Level Assessment Device) presently available tool to screen for Specific Learning Disability, is available in Hindi but not in other regional languages. GLAD would be used in the study. Its usefulness as an effective screening device for Specific Learning Disability, which can be done in resource scarce settings like ours, by the school teachers themselves, would be verified.

Objectives of the Study

5. OBJECTIVES OF THE STUDY

- To evaluate the causes of scholastic backwardness in children studying in Government aided primary schools
- To look for remediable causes of poor school performance of these children

Materials and Methods

6. MATERIALS AND METHODS

The study was conducted as a cross sectional study of descriptive type from January 2007 – November 2008. Fifty children who studied in two Government aided schools coming under the purview of school health cell of Institute of Child Health and Hospital for Children were recruited into the study:

1) Government Primary School, Thana Chetty Street ,

   Purasavakkam, Chennai.

2) Government Primary School, Ram Theatre complex,

   Kodambakkam Main Road, Chennai.

These fifty children were studying in the III Standard and were identified by the Class teacher as scholastically backward based on his failure to progress into the subsequent grade in the Activity Based Learning method in one or more subjects. Both individual and institutional consent obtained prior to enrolment in the study.

Tools Used

1) **General Information** :

A structured data collection form was used to collect information from the mother and class teacher to assess (Annexure I):

- Demographic parameters
- Family aspects
- Sociocultural aspects
- Other information related to the intellectual functioning of the child

2) **Health related Information**

The following aspects of the general health of the child were recorded:

- Anthropometry
- Hemoglobin status

3) **Vision**:
Visual acuity was assessed using a Snellen's Chart

4) Hearing:
The selected children underwent an otoscopic examination and Pure tone audiometry using Amplaid 300 clinical audiometer. Following a thorough ENT examination, pure tone audiometry was performed in a sound proof room for these children. Both air and bone conductions were tested at low, mid and high frequencies.

5) Scholastic Skills:
GLAD (Grade Level Assessment Device) was used to assess scholastic Skills. (Annexure IV) It was procured from the National Institute of Mental Health – NIMH, Hyderabad and it was translated into the Tamil version by vernacular experts and back translated. The original and the back-translated versions were compared and further corrections were made. This tool was administered to 10 children studying in the same two schools – identified as average performers to check the empirical usefulness of the tool. All the average performing children were able to do the tool well. Inter rater variability also checked empirically. Finally the tool was administered to the scholastically backward children. The GLAD scale assesses the following domains of Scholastic skills:

a. Reading Skills

b. Reading comprehension

c. Writing Skills & Written Expression

d. Arithmetic skills

The duration to complete the two subjects – Tamil and Mathematics were recorded. The incentives required and the excuses the child gave while performing the test were also recorded in the data collection form. The results thus computed were entered into a master chart. The observations that were made are discussed subsequently.

The children who had impairments in vision or hearing were referred to appropriate centers for help, those who were found anemic were treated with iron supplements and children with Specific Learning Disability were refereed to the Child Guidance Clinic.

Definition of Outcome Variables:

1) **Subnormal Intelligence**:

- Poor score (<50%) in all the domains of GLAD
- Not able to perform >4 out of the 8 extra academic activities

2) **Specific Reading Disorde**r :

- Normal visual acuity
- Normal in hearing assessment
- Good score (>50%) in all the domains of GLAD EXCEPT tests which assess the child's reading skills (<50%)
- Able to perform >4 out of the 8 extra academic activities

3) **Specific Spelling disorder** :

- Normal visual acuity
- Normal in hearing assessment
- Good score (>50%) in all the domains of GLAD EXCEPT tests which assess the child's writing skills (<50%)
- Able to perform >4 out of the 8 extra academic activities

4) **Specific Arithmetic disorder** :

- Normal visual acuity
- Normal in hearing assessment
- Good score (>50%) in all the domains of GLAD EXCEPT tests which assess the child's writing skills (<50%)
- Able to perform >4 out of the 8 extra academic activities

5) **Slow learner / SLD (Mixed type)** :

- Poor score (<50%) in all the domains of GLAD
- Able to perform >4 out of the 8 extra academic activities

Non Academic Outcome Variables:

1) **Paternal Alcoholism**: indulgence of alcohol abuse by father

This affects the harmony at home (irrespective of frequency)

2) **Play**: Any extra academic activity involving physical exertion – both organized and unorganized.
3) **Breakfast**: The first meal of the day that has been taken in the morning, before going to school (i.e., before 9am)-'Breakfast' is any food item solid or liquid excluding caffeinated drinks
4) **Television viewing**: Having access to television and spending at least half an hour per day in viewing television
5) **Late comers**: Children who come late to school - after ringing of the bell or singing of the prayer song at least once a week for four week OR three days a month.
6) **Anemia** : Complete Blood count hemoglobin estimation less than Or equal to 12 gm %.

Results

7. RESULTS

Fifty scholastically backward children who were studying in Class III were identified with the help of the class teacher. Twenty five children were selected out of 170 children studying in the first school and the other twenty five were selected from amongst the 307 children studying in the second school, based on the sample size required for the study. Two children studying in the first school were being brought up in a hostel.

The results of the study will be discussed under the following headings:

1) Demographic Data
2) Family issues
3) Socio Cultural factors
4) Health issues
5) Screening for Learning disabilities
6) Co-relation of Poor School performance with sociocultural, demographic and medical aspects

1. Demographic Data

The demographic data will be discussed under the following aspects:

a) Age
b) Sex
c) Type of home
d) Lighting Conditions

e) Water supply

f) Personal hygiene

Age

The age distribution of the 50 children who had been recruited into the study is depicted below:

Table:1 Age Distribution (n=50)

Age in completed years	Number (%)
7	2 (4)
8	32 (64)
9	12 (24)
10	2 (4)
Not known	2 (4)

68 % of the children were 8 years and below, and 28 % of them were 9 years and above. The accurate age was not known in the two children who had been adopted by various homes from Sri Lankan refugees and after the Tsunami disaster from Indian Coastal Areas.

Sex

Table: 2 Sex Distribution (n=50)

SEX	Total	Scholastically backward (n)	Scholastically backward (%)
Male	285	30	9.5 %
Female	192	20	9.6 %

The ratio of male: female was 3: 2 amongst the fifty children who were recruited into the study. There is no sex difference in percentage of children identified as scholastically backward. However it is worth noting that substantially lesser number of female children have been recruited into the two school compared to the male children population.

Type of house

Table:3 Housing Pattern (n=50)

Type of house	number (n)	percentage (%)
Own	1	2
Pucca	29	58
Kutcha	16	32
Tent	2	4
Hostel	2	4

Out of the selected children 60 % of the

children lived in own houses/ pucca houses , whereas 36 % of tem were being brought up in Kutcha and Tent houses. Two children are being brought up in hostels.

Lighting Conditions :

Table:4 Lighting conditions (n=50)

	Tube Light	Bulb Light	Common
Numberof children (%)	18 (36 %)	26 (52 %)	6 (12%)

It was observed that 36%, 52 % and 12 % of the children read in tube, bulb and common lights respectively.

Water supply

Table:5 Water Supply (n=50)

Water	Number (n)	Percentage
2 taps at home	2	4
1 tap at home	4	8
Common Tap	25	50
Well / Lorry	17	34

It was observed that only 6 families had independent water supply.

Personal Hygiene

Table:6 Defaecation Pattern (n=50)

Personal Hygiene	Number	Percentage
Open Air defecation	6	12
Common toilet	30	60
1 toilet at home	12	24
> 1 at home	2	4

12 % of the children still use open air defecation, inspite of being in urban areas.

2. **Family Issues**

Parental Factors Forty six children were living with their biological father and their biological mother. (Father and Mother of one child each had expired)

Education

Table:7 Parental Education (n=47)

Education	Father (%)	Mother (%)
Post High school	2 (4)	1 (2)
High School	10 (20)	5 (10)
Middle School	9 (18)	15 (30)
Primary School	12 (24)	12 (24)
Illiterate	14 (28)	14 (28)

Out of the 47 fathers, it was observed that 18 – 20 % were educated upto the level of either middle or Primary school, 4% beyond the primary school and 28 % illiterate. Maternal education level was upto primary, middle and high School in 12, 15 and 6 children respectively.

Occupation

Table:8 Parental Occupation (n=47)

Occupation	Father (%)	Mother (%)
Profession	2 (4)	1 (2)
Clerical/Shop owner	7 (14)	2 (4)
Skilled Worker	23 (46)	16 (32)
Unskilled worker	13 (26)	17 (34)
Unemployed	2 (4)	11 (22)

The majority of the children (46%) had fathers who were masons by profession and only 4 % of the children had fathers who were in professional services like school teacher. Amongst the 50 children with Scholastic Backwardness 74% of mothers are employed.

Paternal Alcoholism

Table:9 Paternal Alcohol consumption (n=47)

	Number	Percentage
Consumes Alcohol	20	40
Not Consume Alcohol	27	54

54% of the fathers

consumed alcohol at least once daily.

Parental Help in Academics of the Child Amongst the 47 fathers, it was observed that only 4 fathers help the child in academic activities of the child. Amongst the 47 mothers, it was observed that ten mothers help the child in the academic activities.

Sibling Factors

Of the 50 recruited children, 40 had one or more siblings, 8 of them was a single child and 2 were being brought up in a hostel. It was noted that 10 children had siblings with poor school performance (20%) who discontinued the school. Of these 4 were employed and 6 of them were married (mostly girls). Two children had siblings who had frequent change of Schools. The role of the Sibling in the academic activities of the child is depicted below:

Table:10 Pattern of sibling help to the index child (n=40)

Sibling help to index child	number (n)
NO help	10
Receives help in education	20
Monetary help	10

Thus it is observed that that 40 % of the underachievers receive assistance from his/ her sibling and 20% receive monetary help.

3. **Socio-Cultural Aspects**

a. Play time

b. Television viewing

c. Additional Tuition

d. Breakfast habits

e. Attendance

f. Late coming

Play Time

Engagement of the children is double edged weapon as far as the academic achievement of the child is concerned – it can improve the mental faculties of the child or can take an important share in the time allotted for studying by the child. Also the child may not be spending more time in play because of his disinterest in

studies.

Table:11 Pattern of Play – Duration and Frequency (n=50)

Play	Mean (Hrs)	Number(n)
None	0	6
Week end	3.5	20
Daily	1	24

In this study, 20 children engaged in play activities only during the weekends, 24 played for one hour daily. All the play activities were unorganized play activities and were predominantly outdoor play. The mean duration of play was 0.96 hours per day.

Television viewing twenty-seven children have access to television at home. The duration of television viewing is depicted below:

Table:12 Pattern of Television Viewing (n=27)

Duration per day (Hrs)	number (n)
1	5
1.5	11
2	8
2.5	2
3	1

The mean duration of TV Watching is 57 minutes. The predominantly viewed channel were tamil channels like Sun TV , K TV etc, cartoon channels and sports channels in 10 , 16 and 1 child respectively.

Additional Tuition Out of the fifty children, 25 children were attending extra schooling in the form of tuitions to improve their academic performance. All of them attended tuitions in the evening time (after school hours), none of them in the morning time. The mean duration of tuition attendance was 1.34 hours.

Breakfast Habits Breakfast was defined as "the first meal of the day that has been taken in the morning, before going to school (i.e., before 9am)". Reliable data regarding breakfast could be obtained in 25 children. The pattern of breakfast taken by 25 of these children were: 3 children frequently skipped breakfast frequently, 22 did not miss. The common food items that were taken in the morning included Idlies, Bun, Kanji (Porridge) etc. This was assessed because irregular Breakfast habits have been implicated as a causative factor for poor Scholastic performance. Our Study population were more or less regular with their breakfast.

Attendance The number of days the child had attended school was taken into account to calculate the Attendance percentage :

Table:13 Attendance pattern (n=50)

Sl No	Attendance (%)	Number n(%)
1.	< 60	4 (8)
2.	60 – 80	9 (18)
3.	> 80	37 (74)

Seventy four percentage

of the children had good attendance more than 80%, 18 % had attendance between 60 – 80 % and 4 children had < 60%. The poor attendance may be significant contributing factor for the poor performance in these 4 children.
Late coming Data pertaining to Children who come late to school - after the ringing of the bell or singing of the prayer song at least once a week for four week OR three days a month – was collected. Four (8 %) of them were frequent latecomers.

3) **Health Issues**

The selected children were screened for the following medical problems that can have an impact on the scholastic performance:

a. Visual Handicap
b. Auditory Handicap
c. Anemia

Visual Handicap The children were screened for refractory eye errors by means of the Snellen's chart**.** Out of the fifty children, two children were wearing spectacles. Of these two, one had appropriate visual acuity with glasses other required further correction. Of the remaining 48 children, refractory error was recognized for the first time in 4 of them – three had visual acuity < 6/18 in the better eye and one had Acuity > 6/18 in the better eye.
Auditory handicap: In pure tone audiometry hearing is assessed for both air and bone conduction between 250 to 8000 Hz and 250 to 4000 Hz respectively. On the air conduction, tested between 250 to 8000 Hz, hearing is assessed in 3 different ranges of frequencies: Low frequency (250 to 1000 Hz), Mid frequency (1000 to 4000 Hz) and High frequency (4000 to 8000 Hz)
Sensory Neural Hearing Loss was present in three children. WHO recommends the following classification : Mild (26 TO 40 db), Moderate (41 to 55 db), moderately severe (56 to 70 db), Severe (71 to 91 db) and Profound (>91 db). Two children had abnormalities in the high and mid frequency range and one showed abnormalities in all the ranges. It was also observed that two showed mild and one showed moderately to severe hearing loss. Audiometry was normal in 47 children.
Anemia: Hemoglobin was estimated in the study population to screen for Anemia.

Table:14 Classification of Hemoglobin Status (n=50)

	Number (n)	Percentage
Not Anemic (>12 gm %)	10	20
Mild Anemia(10 – 11.9 gm%)	24	48
Moderate Anemia(7 – 9.9 gm%)	14	28

Severe Anemia(<7 gm%)	2	4

Forty children (80%) of the children had Anemia as per the WHO definition. Of these, 48 %, 28% and 4% had mild, moderate and severe anemia respectively. The mean hemoglobin of our study population was 10.1 gm %.

General history and medical examination revealed:

- Three children had febrile seizures in their childhood - one child had received Anti-epileptic drug prophylaxis.
- Four children with speech problems : two children had stammering and two children had speech delay.
- One child was a Nepali family who had migrated to Chennai recently (had a knowledge of Hindi and Nepali only)
- One child admitted previously for an illness for 28 days.

5) **Screening for Learning Disabilities:**

The performance of the Children in the GLAD discussed under:

a) Reading skills

b) Reading comprehension

c) Writing skills and written expression

d) Arithmetic skills

Apart from these the time taken to complete and incentives required , recorded. Finally the general skills assessed by means of the Questionnaire were compared with scholastic skills assessed be means of the GLAD.

Reading Skills: Child asked to read a passage consisting of about 7 lines (which is a part of the GLAD).

Table:15 Patterns of difficulties in Reading (n=50)

Twenty children could not read any thing in the Passage. Twenty four children

Pattern of Reading	Number of children with Reading pattern (%)
Not able to read the passage	20 (40)
Able to read passage with No difficulty	6 (12)
Able to read passage with difficulty	24 (48)
Spell aloud before blending	12 (24)
Too slow reading	12 (24)
Mispronouncing words	3 (6)
Misses .	4 (8)
Difficulty in using few letters in tamil	2 (4)
Omit a word	2 (4)
Misses Symbols	3 (6)

read the passage with lot of mistakes – of which sixteen Children could read only

words, but not sentences. The remaining six children read the passage with no difficulties.

Reading Comprehension:

To assess the reading comprehension the children were

administered two Passages and questions were asked from these

passages, to assess their Comprehension of these passages.

- One passage was read out to the child by the investigator
- One passage had to be read by the child.

Table:16 Patterns of Reading Comprehension recognized (n=50)

Pattern Recognised	Number of children (%)
Not able to read and Answers No Questions	20 (40)
Read with No difficulty answers all questions	6 (12)
Read with difficulty but with no Comprehension	6 (12)
Read with difficulty but with some Comprehension	18 (36)
a) Refers to answer	7 (14)
b) Refuses to Read Large passages	7 (14)
c) Answers need to be pointed	2 (4)
d) Wants appreciation for each test	1 (2)
e) prompts required	2 (4)
f) Wrong answers	1 (2)
g) Refers to text	1 (2)

Six were able to read the passage and answer most of the questions. Twenty four of them read the passages with difficulty and the following problems were noted in many of them. Of these 24 children, 6 did not have any comprehension of the passage they had read . Out of the fifty children, twenty children could not read the passage.

Writing skills and written expression: To assess the writing skills of these children, they were told to write 5 lines about their school, and passage was dictated to them – Both these exercises are part of GLAD. The following are the problems identified in them as they performed the GLAD test:

Table:17 Patterns of Assessment of Writing Skills (n=50)

Sl No	Pattern recognized	Number n (%)
1	Able to write with No Difficulty	2 (4)
2	Able to write Alphabets only	24 (48)
3	Able to write single words only	15 (30)
4	Able to write sentences with Lot of Mistakes a) No Spacing b) Ignore punctuation c) Over writing d) Omits dots e) Macro Writing f) Mixes Symbols g) Spelling Mistakes	11 (22) 10 (20) 8 (16) 6 (12) 4 (8) 4 (8) 4 (8) 3 (6)

Out of the 50 children who performed the two tests:

- 2 children performed the tests well, made no mistakes

- 24 children had poor writing skills – able to write only alphabets

- 26 children had the capability to judge and write – (of these 26, 15 wrote only words pertaining to their school and 11 wrote sentences pertaining to their school with lot of mistakes).

Arithmetic Skills To assess the mathematical skills of the children the following tests were administered to these children which are a part of GLAD.

- ❖ Ability to read 10 numbers
- ❖ Perform calculations
- ❖ Comparison between two numbers
- ❖ Read text sums and answer questions
- ❖ Create fractions from simple pictures
- ❖ Write decimals from rupees and paise

Ability to read numbers The level of knowledge of numbers is depicted in the table below :

Table:18 Highest number the child knows (n=50)

Maximum number	1000	100	50	20	10	None
Subjects (%)	4 (8)	7(14)	14(28)	17(34)	6(12)	2(4)

Nearly 92 % of these children had a knowledge of numbers only uptil 100.

Calculations: The children were administered few arithmetic computations involving addition, subtraction, multiplication and division and their ability to perform these was assessed.

Table:19 Patterns of Assessment of Arithmetic Skills (n=50)

Pattern Recognised	Number of children (%)
Not able to do any Calculations	30 (60)
Able to do all Calculations	4 (8)
Does Calculations with lots of Difficulty	16 (32)
Wrong Symbols	7 (14)
No place Value	4 (8)
For Addition Draws Line	4 (8)
For Subtraction Draws line	4 (8)
Wrong Identification of symbol	4 (8)
No Carry over in Addition	2 (4)
No Borrowing in Subtraction	2 (4)

Out of the 50 children who were administered these tests, 30 children could not do any calculation, 4 children performed most of the calculations with minimal difficulty (however with smaller numbers). Difficulties in the remaining is depicted above. **Comparison** When comparison between two numbers was assessed, it was noted that –

- 13 able to apply correct symbols with small numbers

- ❖ 2 children performed the operations 100 % correctly
- ❖ 5 children knew < and >, but not =
- ❖ 7 children understood the concept but did not write
- ❖ 23 children did not understand the whole concept

None of them were able to perform division and none of them were able to perform the **text sums**. It was also noted that out of fifty children only two children were able to create **fractions** out of the figures that were provided, and only one child had basic concept of **decimals**.

Duration and Incentives

Duration of Tamil test The duration taken to complete the tamil test was < 1/2, ½ - 1 and > 1 hour in 20, 14 and 16 children respectively. Most of the children who completed in < 30 minutes have an ability to read and write tamil uptil the level of alphabets.

Duration of Mathematics The duration taken to complete the tamil test was < 1/2 , ½ - 1 and > 1 hour in 34, 12 and 4 children respectively. Most of the children who completed in < 30 minutes have a knowledge of numbers uptil < 100 and are unable to perform basic arithmetic like addition, subtraction etc., Hence hand over the test sheet very early.

Incentives Required and Excuses Made When the children were administered GLAD, Seventeen children required small incentives like chocolates, coloring pencils, crayons etc. Out of the 50 Children who were administered GLAD, 46 % of them made Excuses to avoid performing the test. The common excuses made by these children (Some children made more than one excuse) is depicted in the table:

Table:20 Pattern of Excuses made by the children (n=23)

Sl No	Excuse form	Number n(%)
1	Attend to Toilet	5 (10)
2	Expresses tiredness	8 (16)
3	Want to get rubber	8 (16)
4	Want to sharpen pencil	14 (28)
5	Feeling hungry	5 (10)

Comparison of Scholastic and General abilities:

The scholastic skills obtained from the GLAD were compared with the General abilities of the child assessed through the proforma.

Table:21 Final Diagnosis Based on Comparison of the Scholastic Skills and general abilities of the child (n=50)

Sl No	Diagnosis	Number (%)
1	Subnormal Intelligence	10 (20)
2	Specific Learning Disability	12 (24)
3	Slow learner	28 (56)

Our study showed 12 child two have SLD. Of these twelve, 3 had difficulty each in written expression, reading, reading comprehension and arithmetic skills. These children have difficulty in performing in one domain, good performance in all other domains. These children would require remedial education by trained personnel. A child with subnormal intelligence would require an assessment of IQ and training in special schools. A child classified as a slow learner would require extra coaching at school and home. It was also observed that out of the 28 Slow learners, cause could be attributed for the Scholastic cause in only 20. To distinguish the remaining 8 from mixed Learning Disabilities, an assessment of IQ needs to be done.

6. Co-relation of Specific Learning Disability with Sociocultural, Demographic and Medical factors

Table:22 Pattern of Demographic and Family issues in Children with Specific Learning Disability (n=50)

		SLD	SLOW LEARNER	SUBNORMAL INTELLIGENCE
Sex	Male (30) Female (20)	6 (50) 6 (50)	18 (70) 10 (30)	6 (60) 4 (40)
Housing	Advantage Disadvantage	6 (37.5) 4 (11.5)	8 (50) 22 (64.7)	2 (12.5) 6 (17.6)
Lighting	Advantage Disadvantage	8 (16) 4(8)	14 (28) 24 (48)	6 (12) 4 (8)
Water Supply	Advantageous Disadvantage	6 (50) 6 (50)	6(21.4) 22(78.5)	4 (40) 6 (60)
Maternal Education	Illiterate Educated	1 (2) 11 (22)	10 (20) 17 (34)	3 (6) 5 (10)
Maternal Occupation*	Unemployed Employed	6 (12) 6 (12)	2 (4) 25 (50)	3 (6) 5 (10)
Maternal Help	Help No Help	4 (8) 8 (16)	5 (10) 22 (44)	1 (2) 7 (14)
Paternal Alcoholism	Present Absent	5 (10) 7 (14)	19 (38) 8 (16)	3 (6) 5 (10)
Sibling with Similar problem	Present	5 (33)	8 (56)	2 (11)

(* - p-value statistically significant)

It was observed that there is no sex preponderance in children with Specific Learning Disability. It can be observed that a slightly higher population of the children with SLD live in advantaged housing conditions (own / pucca house), where as a large proportion of the Slow learners live in disadvantaged housing conditions. Children with Specific Learning Disability have access to tube light for study purposes in a higher percentage, as compared with Slow learners who study under disadvantaged lighting (Bulb / Common lighting) conditions in a majority of times. Advantageous water supply was considered in those children in whom water was readily available at home (Separate water supply). Children with Specific Learning Disability have Advantageous water supply in a higher percentage , as compared with Slow learners who study under disadvantaged water Supply (Common water supply) in a majority of times. It was observed that 50 % of the dyslexic children had mothers who were Unemployed. Out of the 14 children with Illiterate mothers, 10 children were classified to be Slow learners and 1 child had Specific Learning Disability 33 % of the Children with Specific Learning Disability received help from mother in School related activities, whereas only 10 % of the children with subnormal Intelligence and 16% of the children who were classified as Slow Learners received maternal Help. Out of the Academic problems that were present in siblings of fifteen children, two of them had Sub normal Intelligence, eight of them were slow learners and five of the (46%) were children with Specific Learning Disability. Hence a genetic factor that may be operating in these children needs to be evaluated. The difference between the three groups pertaining to the various factors was not statistically significant in any of the factors except for maternal occupation. This can be explained by the small sample size of this study.

Table:23 Pattern of Socio cultural and scholastic issues in children with Specific Learning Disability (n=50)

	SLD (n=12)	Slow Learner (n=28)	SubNormal Intelligence (n=10)
Duration of play (hrs)	0.94	0.82	1.03
Television Access	5 (43)	16 (63)	6 (60)
TV viewing Tamil Sports/cartoon	 1 (20) 4 (80)	 4 (33) 12 (66)	 5 (83) 1 (17)
Tuition	8 (66)	14 (50)	3 (30)
Excuses during GLAD	7 (56)	11 (39)	3 (30)
Incentives during	7 (56)	8 (28)	2 (20)

GLAD			

In the study population – 60% of the children with subnormal intelligence, 43% of the children with Specific Learning Disability and 73% of the children who are slow learners have access to television. It was observed that children with Specific Learning Disability seem to be more interested in sports channel and cartoon channel, rather than vernacular language channel. It is observed that 66% of the children with Specific Learning Disability have access to extra schooling – which is higher than the other two groups. Out of the 17 children who required incentives to complete the test, 7 of them i.e more than 50 % of the children required incentives like chocolates, coloring pencil etc. Out of the 21 children who made excuses while performing the GLAD, it was noted that 7 of them had Specific Learning Disability – i.e more than 50% of children with Specific Learning Disability made excuses. Though results show a trend, there was no statistical significance. It is interesting to make the following observations :

- Children with Specific Learning Disability don't miss breakfast
- Children with Specific Learning Disability are punctual
- Children with Specific Learning Disability have good attendance

8. SUMMARY OF THE RESULTS

The profile of a **Slow Learner,** that was observed during the study is made below

- Sex preponderance – slightly more common in males
- Disadvantageous social living conditions pertaining to water supply, housing, lighting
- Is likely to have a mother who is employed
- Likely to have a father who is an alcoholic
- Less Likely to have a sibling with academic problems
- Engages in play activities like other children
- More interested in Tamil channels in television
- Less likely to be sent to tuition
- Has good attendance and punctuality record in school

- Not getting distracted, not wanting incentives to perform and

  Does not use avoidance tactics

The profile of a child with **Specific Learning Disability**, that was observed during the study are made below

- No marked sex preponderance
- Advantageous social living conditions like water supply,

  housing, and lighting
- Is likely to have a mother who is unemployed, educated and

  available for guidance
- Likely to have a sibling with academic problems
- Engages in play activities like other children
- More interested in cartoons and sports channels in television
- More likely to be sent to tuition
- Has good attendance and punctuality record in school
- Not much distracted, may wants incentives to perform and

  likely to use avoidance tactics

Discussion

9. DISCUSSION

Demographic Pattern

In this study, no sex difference could be recognized in children with SLD. The same observation has been made by Shaywitz SE et al[50] Also, the children with SLD were living in relatively advantageous housing, lighting conditions, water supply and personal hygiene conditions as compared to the conditions prevailing in the homes of Slow Learners. This emphasizes the already known fact on SLD[1] that these children are not able to do well in school inspite of being reared in good socioeconomic conditions. The adverse circumstances under which the Slow learners may be a significant contributory factor for their scholastic backwardness[37].

Family Issues

In this study population, 28% of both fathers and mothers were illiterate. Same results were shown by the study by MKC Nair et al[9]. The low level of education may lead to poor stimulation and low motivation of the children towards studies. Parents of 27 children consume alcohol regularly. This can have a psychological impact on these children – which can affect school performance. The same observation has been made by Shenoy et al[2]

In this study, eight children with Specific Learning Disability had a sibling with a similar problem. Hence, the existence of a genetic factor operating in these children need to be operated[25]. Speech problems were present in three of the twelve children with SLD - This is in concurrence with other Van Alphen P et al that Language delay is an early marker of SLD.

Socio-cultural Factors

The mean duration of Play was 53 minutes which is lesser than the duration mean duration of television viewing 57 minutes. A study by Shenoy et al[2] reported that decreased hobbies like no hobbies like No play activity is a risk factor for Scholastic Backwardness. This study made an observation that more than 50% of the scholastically backward children have access to television. This is in conjunction with the observation by Hancox et al [36] that television viewing has an adverse implication on School performance. It is also observed that most of the children with Specific Learning Disability are interested in cartoon and sports channel – This is in agreement with the already existing literature on SLD[1] that these children have normal IQ and are not interested in vernacular language programs.

In this study 50% of the children with scholastic backwardness attend to extra schooling (Tuitions). However the results shown by Shenoy et al[2] that lack of tuitions are a risk factor for poor school performance. This can be explained that

the parents of the baseline population of this study have a lower educational and income pattern – which serves as a stimulating factor for them to provide tuition for their children. Also, in this study, more children with Specific Learning Disability perform badly at school inspite of attending to additional tuitions – Remedial Education is needed for them, not tuitions.[1]

There seems to be a relationship between breakfast consumption and cognition[53]. Gajre and colleagues' study[55] offers tentative evidence that breakfast eating habits are directly associated with acute cognitive functioning, as well as achievement in school subjects such as maths and science. However is this study 90% of the children do not skip breakfast – this can be due to the lower socioeconomic background of this study population which prioritizes eating over school timing. And it is also interesting to note that these children perform poorly at school inspite of not skipping their breakfast.

It is also worth noting in this study that none of the children with specific learning disability came late to school or had poor attendance pattern. This can be due to the good IQ of these children who realize the importance of punctuality and regularity at school for good outcome.

Medical Issues

It is observed in this study that three children have varying degrees of Hearing Impairment – Two of them in mild degrees and one severe degree of Hearing Impairment. This is comparable to the 5% hearing impairment that has been reported by Bess H et al[39]. This Hearing impairment may not be the only causative factor in these children, but is definitely a contributory factor.

It is observed is this study that five children had varying degrees of Refractory eye errors. This is comparable to the 5-10 % prevalence of Visual impairment that has been reported in previous studies by Dandona R et al and Trivedi V et al [17,40]. Children with visual impairment may present with certain features such as deterioration in handwriting, slowness in copying from the board, deterioration activities dependent on eye hand coordination and asking for written instructions to be given verbally.

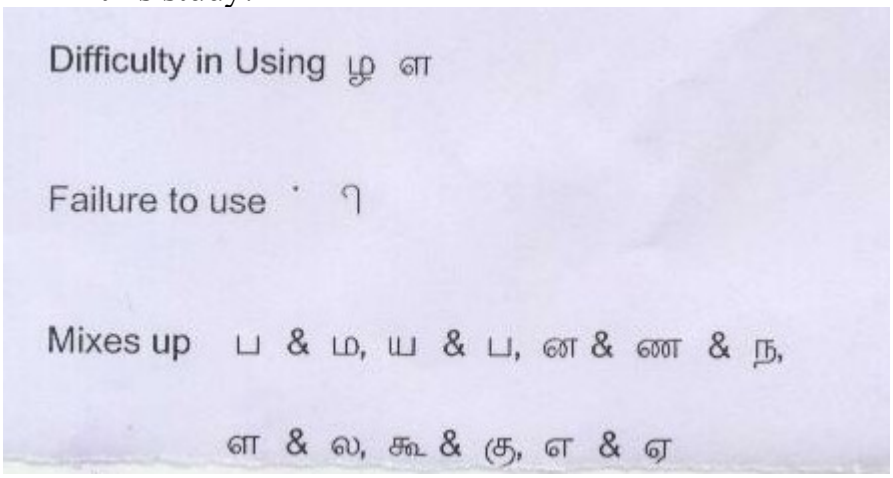
It was observed in this study that forty out of the Fifty children are Anemic as per the WHO Definition – This is very much higher compared to the prevalence of Anemia reported in School going children from Gulbarga as 70.9 % [51] and 38% reported in a study from Urban Punjab[52]. It can be hypothesized that the higher prevalence of Anemia in the study population reflects that Anemia could be a contributory factor for the poor Scholastic performance as Anemia leads to Cognitive impairment.

Specific Learning Disability

In this study 12 out of 50 children were diagnosed as Specific Learning Disability – three children each had Disorders of Reading skills, written language, expressive language and mathematical Skills[23]. It is interesting to observe the lesser occurrence of problems with Reading Skills in this study versus the other

studies by Shenoy et al and Venugopal et al. This may be due to the inherent properties of the Tamil language which is more phonetic (i.e – the writing and pronunciation being very much similar) as compared to english (in which a single word like bus, knife etc can have varied pronunciation).

The following may be the markers of dyslexia in tamil that were recognized in this study:



When the GLAD test was administered to the children, the children with Specific Learning Disability took a longer duration to complete the test – Slow writing is a recognized feature of SLD[1]. Also children with SLD make frequent excuses and demanded lots of incentives- this may be explained by the normal IQ of these children, use avoidance tactics and exploit the situation by making demands for incentives.

Issues emerging from this study

10)ISSUES EMERGING FROM THIS STUDY

- All children with poor scholastic performance must be subjected for assessment of visual acuity by means of Snellen's chart and hearing by means of the pure tone audiometry
- Children with scholastic backwardness and advantageous socioeconomic conditions must be subjected for assessment by GLAD to look for Specific Learning Disability
- Children with overall backwardness and poor performance in the GLAD scale may require assessment of IQ (which is time consuming, expensive and laborious)
- This study is a pilot study which demonstrates the usefulness of the GLAD scale. However it needs to be administered in large samples of population for wider application.

  GLAD Scale may be incorporated into the School Health Services – so that the Pediatrician in conjunction with the school teacher could identify a child with Specific Learning Disability, *EARLY*.

- Also, a **protocol i**s proposed as an outcome of this Study:

A Child identified as Scholastically Backward in Class III by class teacher due to his failure to perform in ABL should be evaluated as follows :

Step 1: Assess Visual Acuity by Snellen's chart

Step 2: Assess Hearing by Pure tone audiometry

Step 3: Administer GLAD to screen for SLD

Step 4: Assess health status including anemia and modifiable family circumstances.

Step 5: Assess Socio cultural factors pertaining to play, TV viewing, and additional tuition.

Step 6: Assess general intellectual functioning of the child

Step 7: If necessary, refer to psychologist for IQ assessment.

Step 8: Appropriate intervention based on diagnosis made

This protocol has to be applied to a large sample for its validation and fine tuning.

Bibliography

1) Dr Jeeson C Unni MD, DCH , Poor Scholastic Performance in Children

2) Thangodorai C et al, Symposium on Scholastic backwardness and LD, IAP TNSC – Pedicon 99

3) http://www.ssa.tn.nic.in/CurrActivities-A.htm

4) Abraham P . Academy Today. Quarterly bulletin of the IAP . The hidden handicap 1999; 69

5) Kawada T. Te effect of Noise on health of children. J Nippon Med Sch 2004: 71: 5 - 10

6) American Academy of Pediatrics. Committee on Public Education. American Academy of Pediatrics : Children, Adolescents and Television . Pediatrics 2001: 107:423-426

7)Dewan A. Environmental Epidemiological study related to aerial spray of endosulfan on cashewnut plantations in Kasargode district of North Kerala. www.cseindia.org/programme/health/pdf/ conf2006/toxins2_dewan.pdf.

8) Cañadas F, Cardona D, Dávila E, Sánchez-Santed F. Long-Term Neurotoxicity of Chlorpyrifos: Spatial Learning Impairment on Repeated Acquisition in a Water Maze. Toxicological Sciences 2005; 85: 944-951; doi:10.1093/toxsci/kfi143.

9) Nair MK, Paul MK, Padmamohan J. Scholastic performance of adolescents. Indian J Pediatr 2003; 70: 629-631.

10)Sovani AV, Shah UR. Chapter 3 on methodology in the monograph "Included": an exploration of six early education pilot projects for children with disabilities in India. SSI, CIDA and UNICEF: 2003.

11) Jongmans MJ, Smits-Engelsman BC, Schoemaker MM. Consequences of comorbidity of developmental coordination disorders and learning disabilities for severity and pattern of perceptual-motor dysfunction. J Learn Disabil. 2003; 36: 528-537

12) Savage R, Cornish K, Manly T, Hollis C. Cognitive processes in children's reading and attention: the role of working memory, divided attention, and response inhibition. Br J Psychol. 2006; 97: 365-85.

13)McKeith RC, Rutter M. A note on the prevalence of speech and language disorders. In: The Child with Delayed Speech. Clinics in Developmental Medicine no. 43 Eds. Rutter M. Martin J AM. London, SIMP, 1972; pp 48-51.

14)Lyon RG. Learning disabilities. The Future of Children. Special Education for Students with Disabilities 1996, 6: 54-76.

15) Davis JM, Elfenbein J, Schum R, Bentler RA. Effects of mild and moderate hearing impairments on language, educational, and psychosocial behavior of children. Journal of Speech and Hearing Disorders 1986; 51: 53-62.

16) Michael R. Vision impairment in Liverpool: prevalence and morbidity. Arch Dis Childhood. 1996; 74: 299-303

17) Trivedi V, Zalawadiya S, Bhatt JV, Pawar T, Kupmavat B. Prevalence of

refractive errors in children (age group 7-15 years) of rural and urban area of Gujarat: a population based study. Journal of Applied Basic Medical Sciences 2006; 8: 128-135
18) Chaudhari S, Otiv M, Chitale A, Pandit A, Hoge M. Pune low birth weight study-cognitive abilities and educational performance at twelve years. Indian Pediatr 2004; 41: 121-128.
19) Bhutta AT, Cleves MA, Casey PH, Cradock MM, Anand KJS. Cognitive and Behavioral Outcomes of School-Aged Children Who Were Born Preterm. JAMA 2002; 288: 728-737
20) Torgesen JK, Alexander AW, Wagner RK, Rashotte CA, Voeller KKS, Conway T. Intensive remedial instruction for children with severe reading disabilities: Immediate and long-term outcomes from two instructional approaches. Journal of Learning Disabilities 2001; 34: 33-58
21) Hammill DD, Leigh JE, McNutt G, Larsen SC. A new definition of learning disabilities. Learning Disability Quarterly. 1981; 4: 336-342
22) American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 4th ed. Washington, DC: American Psychiatric Association, 1994.
23)World Health Organization. The international classification of diseases, vol. 10: Classification of mental and behavioral disorders. Geneva, World Health Organization, 1993.
24) Demonet JF, Taylor MJ, Chaix Y. Developmental dyslexia. Lancet 2004; 363: 1451-1460.
25)Pennington BF, Smith SD. Genetic Influences on Learning Disabilities and Speech and Language Disorders. Child Development 1983; 54: 369-387. doi:10.2307/1129698.
26)van Alphen P, de Bree E, Gerrits E, de Jong J, Wilsenach C, Wijnen F. Early language development in children with a genetic risk of dyslexia.Dyslexia. 2004; 10: 265-288.
27)Donovan SM, Cross CT. Minority students in special and gifted education. Washington, DC: National Academy Press. 2002
28) Shapiro BK, Gallico RP. Learning disabilities. Pediatr Clin North Am 1993; 40: 491-505.
29) Karande S, Kulkarni M. Specific Learning Disability: The Invisible Handicap. Indian Pediatrics 2005; 42: 315-319.
30) Dakin KE. Educational assessment and remediation of learning disabilities. Semin Neurol 1991; 11: 42-49
31) Bryan T. Learning Disabled Children's Classroom Behaviors and Teacher—Child Interactions. Journal of Pediatric Psychology 1979; 4(3): 233-246.
32) Kulkarni M, Karande S, Thadhani A, Maru H, Sholapurwala R. Educational provisions and learning disability. Indian J Pediatr 2006; 73: 789-793.
33) Kaznowski K Slow Learners – National Association of Secondary School Principles Bulletin, Dec 2004

34) Sankar R, Rai B, Pulger T, Sankar G, Srinivasan T. Intellectual and Motor functions in School Children from severely Iodine deficient region in Sikkim. Indian J Pediatr 1994; 61: 231 – 236
35) Dodd NS, Samuel AM. Iodine deficiency in adolescents from Bombay slums.Natl Med J India 1993; 6: 110-113.

36) Robert J. Hancox, MD; Barry J. Milne, MSc; Richie Poulton, PhD: Association of Television Viewing During Childhood With Poor Educational Achievement : Arch Pediatr Adolesc Med. 2005;159:614-618.

37) Krishna Kumar , Calicut – Effect of Individualized Education Plan on Slow Learners : Indian Journal of Pediatrics : Vol 73 No 2 Feb 2006

38) Roberts JE, Burchinal MR, Ziesel SA. Otitis Media in early childhood in relation to children's Academic Skills. Pediatrics 2002: 110 : 696-706

39) Bess FH, Dodd Murphy J, Parker RA. Children with minimal Sensorineural hearing Loss: Education, performance and functional status Ear Hear 1998: 19: 339-354

40) Dandona R, Dandona L, Srinivas M, Sahare P, Narsiah S, Munoz SR. Refractory error in Rural population in India. Invest Ophthalmol 1998; 82: 1265 – 1271

41) Bellisle F. Effects of diet on behaviour and cognition in

children. Br J Nutr 2004; 92: S227-S232.

42) Smith AP, Clark R, Gallagher J. Breakfast cereal and caffeinated coffee: effects on working memory, attention, mood and cardiovascular function. Physiol Behav 1999; 67: 9-17.

43) Milton B, White Head M, Holland P, Hamilton V. The Social and Economic consequences of Chronic Asthma. Child Care Dev 2004; 30 : 711-728

44) Gutstadt LB, Gillette JW, Mrazek DA, Fukuhara JT. Determinants of School performance in children with Chronic Asthma . Am J Dis Child 1989; 143: 471-475

45) Pratinidhi AK, Kurulkar PV, Garad SG, Dalal M. Epidemiological Aspects of School Drop-outs in Children 7-15 years in Rural Maharashtra. Indian j Pediatr1992; 59 : 423 – 427

46) Molfese VJ, Modglin A. The Role of Environment in the development of Reading Skills

47) Shapiro BK, Gallico RP. Learning disabilities. Pediatr Clin North Am 1993; 40: 491-505.

48) Shaywitz SE. Dyslexia. N Engl J Med 1998; 338: 307-312.

49. Katusic SK, Colligan RC, Barbaresi WJ, SchaidDJ, Jacobsen SJ. Incidence of reading disability in a population-based birth cohort, 1976-1982 Rochester, Minn Mayo Clin Proc 2001; 76: 1081-1092.

50) Shaywitz SE, Shaywitz BA, Fletcher JM,Escobar MD. Prevalence of reading disability in boys and girls. Results of the Connecticut Longitudinal Study. JAMA 1990; 264: 998-1002.

51)VinodKumarCS,AnandKumarH.,SunitaV.,InduKapur Prevelance of Anemia in School going girls in Gul;bargaIndian Pediatrics 2003;40:70-72

52) Indian Pediatrics 1999; 36:1181-1186. Prevalence of Anemia Among Urban School Children of Punjab. M. Verma, J. Chhatwal and Gurmeet Kaur

53) Smith AP, Clark R, Gallagher J. Breakfast cerealand caffeinated coffee: effects on working memory,attention, mood and cardiovascular function.Physiol Behav 1999; 67: 9-17.

54). Smith AP, Kendrick A, Maben A, Salmon J. Effectsof breakfast and caffeine on cognitive performancemood and cardiovascular functioning. Appetite1994; 22: 39-55.

55). Gajre NS, Fernandez S, Balakrishna N, Vazir S.Breakfast eating habit and its influence onattention-concentration, immediate memoryand school achievement. Indian Pediatr 2008; 45:824-828.

Annexures

Annexure I

DATA COLLECTION FORM

DEMOGRAPHIC

Name Age Sex
Academic Standard
Address
School per capita Income
Type of House Lighting
Water Supply Personal Hygiene

FAMILY ASPECTS

Father Alive/ dead Mother Alive / dead
Education of father Education of Mother
Occupation of father Occupation of Mother
Participation in Academic activities

Sibling Present or not Sibling age and education
Contribution to the present child's education – Financial / Educational
Details of other family members having academic problems

SOCIO-CULTURAL ASPECTS

Breakfast taken : yes/ No pattern of intake
Is the child dressed well (personal cleanliness)

Television
Access : yes / No Duration: __ hrs Channel viewed :
Play
Yes / No Daily / Week end Duration__Hr
Extra Schooling Tuition :
Yes / No : Duration : __ Hrs
Late coming : Yes / No

Attendance : __ %

OTHER INFORMATION RELATED TO INTELLECTUAL FUNCTIONING

1)	Ability to make Friends	Good	Poor
2)	Self care activities like feeding and dressing	Appropriate for age	Not appropriate for age
3)	Speech delay	Absent	Present
4)	H/oDevelopmental	Absent	Present

	Delay		
5)	Does your child appear dull and mentally backward compared to siblings/ neighbours ?	No	Yes
6)	Ability to participate in sports with age appropriate children	yes	No
7)	Participation in Literary activities	Yes	No
8)	Helping in the teacher in activities like distributing books, minding the class etc	Yes	No

VISION

- Acuity

	6/60	6/36	6/24	6/18	6/12	6/9	6/6	< 6/6
R eye								
L Eye								

Hearing

	R ear	L ear
Otoscopy		
Pure tone audiometry Low freq Mid Freq High Freq		

HEALTH ISSUES

1) CBC Hemoglobin - ___ gm%

2) Miscellaneous Medical Problems

Annexure II

Activity Based Learning

Competencies are split into different parts/units and converted into different activities.

- Each part/unit is called a milestone.
- In each subject, the relevant milestones are clustered and linked as chain and this chain of milestones is called LADDER.
- Each milestone has different steps of learning process and each step of learning process is represented by logo.
- Milestones are arranged in a logical sequence from simple to complex and also activities in each milestone.
- To enable the children to organize in groups group cards are used.
- Evaluation is inbuilt in the system. Separate cards / activities are used for this purpose.
- Each child is provided with workbook/worksheet for further reinforcement activities
- Children's progress are recorded through annual assessment chart.
- Each milestone has different type of activities such as introduction, reinforcement, practice, evaluation, remedial and enrichment activites represented by different logos.

Benefits of ABL approach

- Children learn on their our pace.
- Provision of more time for self-directed learning and teacher directed learning is reduced considerably.
- Group learning, mutual learning and self learning are promoted.
- Teachers teaching time is judiciously distributed among children. Only needy children are addressed by teachers.
- Children's participation in every step is ensured in the process of learning.
- Evaluation is inbuilt in the system it is done without the child knowing it.
- Periodical absence of child from school is properly addressed.
- Classroom transaction is based on child's needs and interests.
- Freedom to child in learning as he chooses his activity.
- Multigrade and multilevel in learning is effectively addressed.
- No child can move to the next higher step of learning unless attains the previous one.
- Sense of achievement boosts child's confidence and morale.
- Attractive cards and activity create interest among children.
- Scope for child's development in creative and communicative skills.
- Children will have a feel of security as they sit in rounds in the groups.
- Children are allowed to move in the classroom as they choose their activity.
- Moreover the distance between the teacher and the child is largely reduced and the teacher acts as a facilitator rather than teacher.

Annexure III

DSM-IV (American Psychiatric Association)

DSM-IV classifies learning disorders as follows -

315. Reading Disorder

315.1 Mathematics Disorder

315.2 Disorder of Written Language

315.3 Expressive Language Disorder

- 315.31 Mixed Expressive-Receptive Language Disorder
- 315.39 Phonological Disorder

315.4 Developmental Coordination Disorder

Common problems in children with Specific Learning Disability

Problems with Reading

- Reads very slowly and word by word.
- Constantly loses place, missing out lines
- Therefore needs to always keep finger below line being read
- Hesitates to read aloud
- Hates reading and refuses to read
- May try to sound out the individual elements of word
- But is often unable to synthesize it into the correct word
- Ignores punctuation, thus often confusing the meaning of the text
- Confusion with alphabet, shapes and positions : b as d, u as n
- Confusion in words : on and no, was and saw

- Omission: bet for belt
- Addition: played for play
- Substitution: house for home
- Mispronounces some words such as: help and held
- Puts syllables in the wrong order: animal and aminal

Problems with Reading comprehension

- Difficulty in reading and understanding questions
- If we read out question, the child can answer
- Cannot made head or tail of text when reading

  Understands and learns better if someone reads out the same text

  Problems with Writing

- Abnormal grip makes writing slow and laborious
- Notes are incomplete and do not make sense.
- Poor in remembering certain alphabets
- Unable to copy from board
- Shows mirror writing
- Write letters in the wrong order : what for what
- Inconsistent errors/some times correct spelling: apple and appel
- Reverses letters and words : b and d
- Inverts letters: n and u
- Omits letters: limp and lip
- Adds letters: went and whent

- Spells the way the word sounds: busy and bizzy

  Weak in punctuation, capitalization

- Poor organization of ideas and sentence structure

- Poor ideas when required to compose an essay

Problem with mathematics

- Uses fingers for calculations even after 8 years.

- Has difficulty with multiplication tables.

- Confuses the basic 4 operations. +, -, X, -:-

- Has difficulty to understand statement problems

- Understands calculations, cannot work out on paper.

- Works out answer correctly, make mistakes while writing

- Directional problems

- Mirror writing 6 for 9

தமிழ்

படிக்கவும்

மாமரத்தை ஹிந்தி மொழிகளில் 'ஆம்லா' என்று சொல்லுகிறார்கள். இந்த மரம் உயரமாக வளர்கிறது. இதன் கிளைகள் தடிமனாகவும், நீளமாகவும் இருக்கின்றன. கோடைக் காலத்தில், மக்கள் இந்த மரங்களின் குளிர்ந்த நிழலில் உட்கார்ந்து கொண்டு ஓய்வு எடுத்துக் கொள்ளுகிறார்கள்.

காதால் கேட்டு / கேள்விகளுக்கு உண்டு - இல்லை என்று பதில் கொடு.

மோகன் 5வது வகுப்பில் படிக்கிறான். அவன் வகுப்பில், எப்போதும் முதல் மாணவனாகவும், விளையாட்டுகளில், மற்றவர்களைவிட முதன்மையானவனாகவும் இருக்கிறான். சியாம் அவனின் நெருங்கிய நண்பன். ஒரு நாள் மோகன், நண்பனை காண்பதற்காக அவன் வீட்டிற்கு சென்று கொண்டு இருந்தான். செல்லும் வழியில் அவன் மேல் ஒரு வாழைப்பழத் தோல் விழுந்தது. மேலும் சில தூரம் சென்றபின் அதிக துர்நாற்றம் வந்தது. அருகில் சென்று பார்த்தால் பாதையின் இரண்டு பக்கங்களிலும் ஓடும் வாய்க்கால் அடைத்திருந்ததால், தண்ணீர் ஓட்டம் தடைப்பட்டு, துர்நாற்றம் அடித்தது. வீட்டை அடைந்த பின், மோகன் சியாமிடம் "ஏன் உனது வீட்டருகில் இவ்வளவு குப்பை சேர்ந்திருக்கிறது" என கேட்டான். அதற்கு சியாம், "எல்லா இடங்களிலும் குப்பை தொட்டிகள் இருந்தாலும், நகராட்சி வண்டி தினமும் குப்பைகளை அகற்றினாலும், மக்கள் குப்பை தொட்டிகளை பயன்படுத்தாமல் தெருவில் எறிந்து விடுகிறார்கள். ஒருவரும் வீதியை சுத்தமாக வைத்துக் கொள்வதில்லை. ஒவ்வொருவரும் அடுத்தவரை குற்றம் சொல்லுகிறார்கள்" என்று கூறினான். மோகன் எல்லா மக்களுக்கும் பின்வருமாறு அறிவுறுத்தினான், "வீட்டின் குப்பையை, குப்பை தொட்டியில் போட்டு, அதன் மூடியையும் மூடிவிடுங்கள், ஏனெனில் குப்பைகளால் வியாதி பரவுகிறது. நகராட்சியின் வேலை, நகரத்தை நன்றாக வைத்திருக்க வேண்டும் என்பது தான். நமது தெருவை சுத்தமாக வைத்திருக்கும் பொறுப்பு நமக்கும் உள்ளது அல்லவா?"

1. வீட்டு குப்பையை பாதையில் வீசி விடவும் - (ஆம் / இல்லை)
2. சியாமின் மேல், மாமரத்தின் கிளை விழுந்தது? (ஆம் / இல்லை)
3. வாய்க்காலின் தண்ணிரிலிருந்து துர்நாற்றம் வந்தது? (ஆம் / இல்லை)
4. சியாமும், மோகனும், ஒருவருக்கொருவர் விரோதிகள்? (ஆம் / இல்லை)
5. சுத்தமாக இல்லாவிடில் வியாதி பரவும் (ஆம் / இல்லை)

3. இதைப்படித்துவிட்டு, பதில் எழுதவும்

இங்கே பார் - குயில் கறுப்பு நிறம். ஆனால், இதன் குரல் - இனிமையாக உள்ளது. குயில் கூ கூ என்று கத்திக் கொண்டு மாமரத்தில் அமர்ந்து பாடியது. குயிலே, இந்தப் பாடலை நீ உன் அம்மாவிடமிருந்து கற்றுக் கொண்டாயா?

குயில் சொன்னது ஆம், அப்படித்தான் என்று.

பதில் கொடு

1. குயிலின் குரல் எப்படி இருக்கிறது?

2. குயில் தன் தாயிடம் என்ன கற்றது?

3. குயிலின் நிறம் என்ன?

4. குயில் எந்த மரத்தில் அமர்ந்து பாடியது?

5. குயில் என்ன பதில் சொன்னது?

உன்னுடைய பள்ளியை பற்றி 5 வரிகளில் எழுதுக.

1.

2.

3.

4.

5.

பின் வரும் கதையை படித்து, பின் வாக்கியங்களை பூர்த்தி செய்க.

அக்பரின் தர்பாரில் பல அறிவாளிகள் இருந்தார்கள். அவர்களில் ஒருவர் பீர்பால். அவர் மிகவும் சாமர்த்தியமானவர். தன்னுடைய புத்திசாலிதனத்தால் பாதுஷாவைக் கூட தோற்கடிப்பார். ஒரு சமயம், அக்பர் பாதுஷா ஏதோ ஒரு கிராமத்தை நோக்கி போய் கொண்டிருந்தார். அது ஒரு குளிர் காலம்; ஆகையால், கிராமத்து மக்கள் நெறுப்பு உண்டாக்கி, அதன் நான்கு புறங்களிலும் உட்கார்ந்து பேசிக் கொண்டிருந்தார்கள். உரையாடலின்போது ஒரு நபர் "நான் யமுனை நதி தண்ணீரில், இரவு முழுவதும் நின்று கொண்டிருக்க முடியும்" என்று கூறினார். இதை கேட்டுக்கொண்டிருந்த அக்பருக்கு இந்த விஷயத்தில் நம்பிக்கை ஏற்படவில்லை. உடனே அவர் அந்த நபரை கூப்பிட்டு "நீ இரவு முழுவதும் தண்ணீரில் நின்று கொண்டு இருப்பாயானால் நான் ஒரு பை தங்கக் காசு உனக்கு பரிசாக கொடுப்பேன்" என்று அறிவித்தார். அந்த மனிதரும் ஒப்புக் கொண்டார். அடுத்த நாள் இரவு அந்த மனிதர் யமுனை நதியின் குளிர்ந்த நீரில், இரவு முழுவதும் நின்று கொண்டு இருந்து விட்டு, காலையில் அக்பரின் அரசவைக்கு வந்தார். அக்பர் ஆச்சரியப்பட்டு "நீ இந்த குளிரில், இரவு முழுவதும் எப்படி நதி தண்ணீரில் நின்று கொண்டு இருக்க முடிந்தது?" என்று கேட்டார். அதற்கு அந்த நபர் "தங்களுடைய அரண்மனையிலிருந்து ஒரு விளக்கு வெளிச்சம் வந்து கொண்டிருந்தது. நான் அதை பார்த்த படியே இரவு பொழுதை கழித்து விட்டேன்" என்று கூறினார். உடனே அக்பர் "அப்படியானால் நீ என்னுடைய அரண்மனை விளக்கின் வெப்பத்தால் தான் குளிரிலிருந்து தப்ப முடிந்தது. அதனால் நான் உனக்கு பரிசு தரமாட்டேன்" என்று சொல்லிவிட்டார்.

தங்ககாசு, அரண்மனை, பரிசு, சமார்த்தியம், ஒரு மனிதர்.

1. ..... யமுனை தண்ணீரில் இரவு முழுவதும் நின்று கொண்டிருந்தான்.

2. பீர்பால், தன்னுடைய ..... காரணமாக பிரசித்தமானவர்

3. ராஜா அக்பர் அந்த மனிதருக்கு ..... கொடுக்க வில்லை.

4. ராஜா சொன்னார் - யாராவது, இரவு முழுவதும் தண்ணீரில் நின்றால், அவர்களுக்கு பை நிறைய ..... கொடுப்பேன்.

5. அந்த மனிதர் ..... யின் விளக்கு ஒளியை பார்த்து இரவு முழுவதும் தண்ணீரில் நின்று கொண்டிருந்தார்.

எதிர்பதம் எழுதுக

1. இருட்டு -
2. கேள்வி -
3. மகிழ்ச்சி -
4. உண்மை -
5. காலை -
6. அவன் -
7. சிறிய -
8. மேலே -
9. சுத்தம் -
10. பணக்காரன் -

DICTATION

பத்தி 1 :

வெளிச்சம் தரும் பல்பை கண்டுபிடித்தவர் தாமஸ் ஆல்வா எடிசன் என்பவர். அவர் அமெரிக்காவைச் சேர்ந்தவர். அவர் பள்ளியில் ஆசிரியர் சொல்லித் தரும் பாடங்களில் கவனம் செலுத்தவில்லை. அவர் பெரும்பாலன நேரங்களில் கனவு உலகத்திலேயே வாழ்ந்து கொண்டிருப்பார். அதனாலயே ஆசிரியர்கள் அவர் மீது நல்ல கருத்து கொண்டிருக்கவில்லை.

பத்தி 2 :

முதலில் ஜனாதிபதி கொடியேற்றினார். அதன் பிறகு போர்வீரர்கள் அணிவகுத்தனர். அணிவகுப்பில் முப்படை போர்வீரர்களும் இருந்தனர். எல்லோரும் அவரவர் சீருடையில் அணிவகுத்தனர். முதலில் தரைப்படை வீரர்களும், அவர்கள் பின்னால் கடற்படை வீரர்களும், அதன் பிறகு விமானப்படை வீரர்களும் அணிவகுத்தனர்.

கீழ்கண்ட கேள்விகளுக்கு பதில் கூறவும்.

1. ராம் ரூ.465 வங்கியில் வைத்திருந்தான். அவன் ரூ.300 மேலும் சேர்த்தான். இப்பொழுது அவனிடம் எவ்வளவு ரூபாய் இருக்கிறது?

.....

2. ஒரு பள்ளியில் 4 வகுப்புகள் இருந்தன. ஒரு வகுப்பில் 50 மாணவர்கள் வீதம் இருந்தார்கள். பள்ளியில் மொத்தம் எவ்வளவு மாணவர்கள் இருந்தார்கள்?

.....

3. ஒரு கிடங்கில் 800 மூட்டைகள் இருந்தன. 450 விற்கப்பட்டது. மீதம் எத்தனை மூட்டைகள் உள்ளன?

.....

4. ஒரு பையில் 250 ஆப்பிள் உள்ளன. 10 பையில் எத்தனை ஆப்பிள் இருக்கும்?

.....

5. பாபுவிடம் ரூ.300 உள்ளது. அவன் ரூ.100 தம்பிக்கும், ரூ.75 தங்கைக்கும் கொடுத்தான். இப்பொழுது அவனிடம் மீதி எவ்வளவு இருக்கும்?

.....

6. ஒரு சோப்பு கம்பெனி 125 சோப்புகளை முதல் நாளிலும், 277 சோப்புகளை இரண்டாவது நாளிலும், 340 சோப்புகளை மூன்றாவது நாளிலும் உற்பத்தி செய்தது. 3 நாட்களில் மொத்தம் எவ்வளவு சோப்புகள் உற்பத்தி செய்யப்பட்டன?

.....

7. ஒரு பள்ளியில் மாணவர்களின் எண்ணிக்கை 250, அதில் ஆண்களின் எண்ணிக்கை 150 எனில், பெண்களின் எண்ணிக்கை .....

8. ஒரு தச்சரிடம் 650 ஆணிகள் உள்ளன. அதில் 400ஐ அவர் உபயோகித்தால், மீதம் எவ்வளவு ஆணிகள் இருக்கும்?

.....

9. ஒரு பண்ணையில் 5000 கோழிகள் இருந்தன. 900 கோழிகள் பறவை காய்ச்சலில் இறந்து விட்டன. மீதம் உள்ள கோழிகளின் எண்ணிக்கை என்ன?

.....

10. ஒரு பையில் 144 ரப்பர்கள் உள்ளன. 24 பைகளில் எவ்வளவு ரப்பர்கள் இருக்கும்?

.....

கீழ்கண்ட எண்களை படிக்கவும்:

(1) 708

(2) 496

(3) 1001

(4) 2709

(5) 5079

(6) 8888

(7) 4367

(8) 2111

(9) 10000

(10) 1000

மணி என்ன?






<, >, =, இந்த குறியீடுகளை வைத்துக்கொண்டு கோடிட்ட இடங்களை நிரப்புக.

(a) 423_____743

(b) 2400_____4002

(c) 100_____1001

(d) 6730_____6073

(e) 3303_____3330

(f) 505_____505

(g) 9991_____9919

(h) 642_____4620

(i) 10000_____1000

(j) 1110_____1011

கீழ்கண்டவற்றை செய்க:

(a) 453
x 25

(b) 931
x 78

(c) 189
x 17

(d) 457
x 13

(e) 603
x 43

(f) 850
x 23

(g) 560
x 15

(h) 850
x 33

(i) 782
x 100

(j) 1800
x 10

கீழ்கண்டவற்றை செய்க:

(a) 437 - 298	(b) 906 - 359	(c) 800 - 217	(d) 469 - 280	(e) 400 - 317
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

(f) 1800 - 1600	(g) 1785 - 285	(h) 7890 - 576	(i) 8059 - 489	(j) 1689 - 100
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

கீழ்கண்டவற்றை செய்க:

(a) $\frac{64}{4}$ = ____

(b) $\frac{24}{2}$ = ____

(c) 8)798 = ____

(d) 3)603 = ____

(e) 497 : 7 = ____

(f) 810 : 5 = ____

(g) $\frac{2734}{2}$ = ____

(h) $\frac{363}{6}$ = ____

(i) 10)970 = ____

(j) 408 : 2 = ____

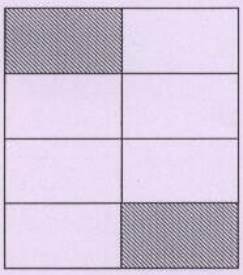
Write the following in short form.

Eg. 5 ரூபாய் 20 பைசா Rs. 5.20

1. 6 ரூபாய் 40 பைசா = _____
2. 3 ரூபாய் 75 பைசா = _____
3. 8 ரூபாய் 60 பைசா = _____
4. 10 ரூபாய் 10 பைசா = _____
5. 7 ரூபாய் = _____
6. 2 ரூபாய் 5 பைசா = _____
7. 80 பைசா = _____
8. 4 ரூபாய் 90 பைசா = _____
9. 35 பைசா = _____
10. 5 பைசா = _____

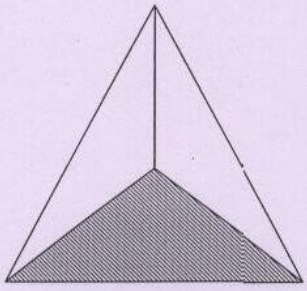
கீழ்கண்டவை எத்தனை பகுதியை குறிக்கும் (பின்னங்களாக எழுதுக):

(a)



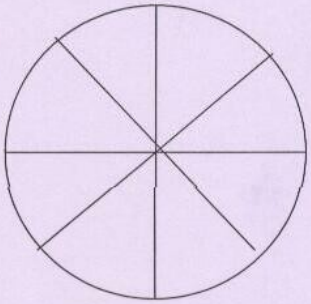
_____

(b)



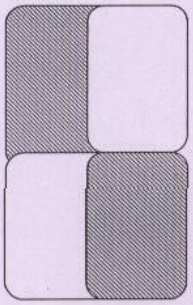
_____

(c)



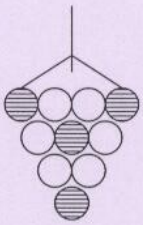
_____

(d)



_____

(e)



_____